Advances in Forensics

It wasn't until the early nineteenth century that hair, blood and fingerprints were used as evidence to pinpoint the whereabouts of a criminal. Despite the late birth of forensic science, technology is now moving so swiftly that it is becoming difficult for legislation to keep up.

Detectives will soon be solving gun crimes and murder cases far faster by using a simple handheld device that instantly confirms whether a suspect has fired a gun. Lab delays mean suspects often get away.

This handheld forensic tool could take X-ray fluorescence (XRF) readings at the crime scene and send them to a computer for instant analysis, without destroying physical evidence. It should take a few minutes and give crime teams enough feedback to arrest a suspect – or not. The technology was developed by NASA to measure the wavelengths emitted by different substances. Jacob Trombka, a NASA physicist, says, '…by 2003, we should be testing it in real life situations'.

Murder detectives should also soon be able to determine how long a person has been dead for, and also discover information about where the person lived. For example, Stuart Black, an environmental geologist at the University of Reading, determined that a man who had been repeatedly stabbed and then set on fire, was probably from the former Soviet Union and had been dead for about a week.

Forensic scientists normally rely on studies of how bodies decay in different climates. However the temperature and moisture conditions make these methods imprecise. Instead, Black looks at the decay of radioactive isotopes. This technique is similar to carbon dating but focuses on isotopes with shorter half lives than carbon 14. Police are so impressed with his work that Black's lab are already working on two other murder cases and three more are awaiting analysis.

The Forensic Science Service (FSS) in Birmingham has the biggest DNA database in the world. Police have recorded a 40 per cent success rate in matching DNA clues at the crime scene to samples held on the database. It is a technically challenging time for a criminal. However hard they try, they can't avoid leaving those devastating biological clues behind that reveal everything about them.

Until now, a DNA fingerprint has required between 200 and 500 cells to be effective. Now a single cell may be enough. What's more, forensic scientists may be able to build a perfect 3D photofit of a suspect from that same cell as well as an in-depth personality profile.

But what if this information falls into the wrong hands? Are DNA databases vital weapons in proving guilt and innocence or a major violation of civil liberties?

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A: Working in pairs, write down the different stages involved in the initial crime scene examination.

B: Read the text and discuss your reaction to it with a partner.

C: Look again at the questions raised at the end of the text and note arguments for and against DNA databases.

For DNA databases	Against DNA databases

D: Fact Box:

The state-of-the-art Forensic Science Laboratory in Birmingham is the biggest in the world. There are currently 1.8 million criminal justice profiles on the database, as well as 188,000 DNA samples from unsolved crimes. The samples are identified by barcodes, so no one in the lab knows the names or backgrounds of the samples being tested. The people who work in the lab never cross, in case you were carrying DNA on you. Each lab is on a separate air conditioning system and automation has reduced the risk of contamination.

Are these standards maintained globally?
What are the laboratories like in your country?
Discuss the implications of differing standards in Forensic Science Laboratories.

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Teacher's Notes

Summary: To develop Ss ability to read and understand complex texts in English; to focus on collocation and prepositions in context

Procedure:

1) Ask Ss some leading questions:
   What is evidence? (Facts which help prove something at a trial). Where is evidence found? Who is responsible for Crime Scene Investigations in your country? Does it differ with different crimes? Who is responsible for specialist forensic examinations?

2) Refer Ss to the instructions for section A. In pairs, Ss write down the different stages involved in the initial crime scene examination. Hold short feedback stage.

3) Ask Ss when the science of forensics was first used as evidence (early 19th Century). What changes have been made since the birth of forensics? What stage of technological advancement is your country at?

4) Refer the Ss to instructions for section B. Ss read the text and discuss their reaction.

5) Refer the Ss to instructions for section C. In pairs, Ss discuss the questions raised at the end of the text and note arguments for and against DNA databases. Hold feedback stage:

For	Against
• Fairer to have database for all • Vital and comprehensive weapon in fight against crime • Open up possibility for international databases fighting terrorism and crime	• Invasion of civil liberties • Dangerously valuable database • It may fall into the wrong hands • Dilute effective of criminal community specific database

6) Cite examples of countries which have or aspire to have databases for the whole population (Iceland ✓, Britain, Estonia). What do you know about the situation in your country? How do you feel about this?

7) Optional language focus: The text is rich in dependent prepositions (surprised to) and collocations (noun + noun - murder detectives; adj + noun - physical evidence). Ss go through text and find examples.

8) Refer Ss to the fact box (section D). Discuss implications of differing standards in Forensic Science Laboratories.

